

KARASEV, L.V.; GOROKHOV, G.A., slesar'; KALININ, V.P., slesar'.

Remodeling small PD trimmers. Suggested by L.V.Karasev, G.A.
Gorokhov, V.P.Kalinin. Rats.i isobr.predl.v stroi. no.14:
28-30 '60. (MIRA 13:6)

1. Glavnyy mekhanik derevoobdelochnogo zavoda No.3 tresta
Stroydetal'-shoydetal-82 Glavleningradstroya (for Karasev).
(Saws)

KARASEV, M., dotsent.

Cooperation with the industry. Vest.Mosk.un. 11 no.6:164 Je '56.
(Engineering laboratories)

KARASEV, M.

A course for the community. Voen.znan. 40 no.11:43 N '64.
(MIRA 1821)

1. Nachal'nik Dnepropetrovskogo morskogo kluba.

COMMON ELEMENTS										COMMON VARIABLES INDEX									
<p>KARASOEV, M.A.</p> <p>23</p> <p>Karasov, M. A. Thermit Welding. [In Russian.] Pp. ii + 48. 1935. Moscow: Stokhogr. Organometalla. (Rbl. 6.)</p>										<p>ASB-51A METALLURGICAL LITERATURE CLASSIFICATION</p>									
<p>1ST AND 2ND GROUPS</p>										<p>3RD AND 4TH GROUPS</p>									
<p>1ST AND 2ND GROUPS</p>										<p>3RD AND 4TH GROUPS</p>									

KARASEV, M.A.

Teaching

Retaining the attention of pupils during repetition. Est. v shkole no. 2. 1952

Monthly List of Russian Accessions, Library of Congress, July 1952. UNCLASSIFIED.

KARASEV, M.A., mayor, starshiy prepodavatel' biologii.

How birds discern their enemies. Est.v shkole no.5:83-84 S-O '53.

(MLRA 6:8)

1. Kuybyshevskoye suvorovskoye voyennoye uchilishche.

(Birds)

KARASEV, M.A.

Nesting of redstart in dwellings. Priroda 44 no.12:116-117 D '55.
(MIRA 9:1)

1. Kuybyshevskoye Suvorovskoye uchilishche.
(Redstarts)

KARASEV, M.A. (Rostov-na-Donu).

Saiga in Rostov Province. Priroda 46 no.8:99-100 Ag '57. (MLRA 10:9)
(Rostov Province--Saiga)

KARASEV, M.A.

Migrations of the saiga in Rostov Province. Migr. zhiv. no. 2:42-
44 '60. (MIRA 13:12)

1. Zheleznodorozhnaya shkola No 2, Rostov-na-Donu.
(Rostov Province--Saiga) (Animal migration)

KARASEV, M.A.; LEVIN, V.P.; MITROFANOV, G.I.; TIMOFEYEV, I.V.;
SHAROBOYKO, T.N., red.

[Descriptive geometry; a textbook] Nachertatel'naia
geometriia; uchebnoe posobie. Leningrad, In-t inzhenerov
zhel-dor. transp. Pt.1, no.2. 1964. 75 p.
(MIRA 17:12)

1. Leningrad. Institut inzhenerov zheleznodorozhnogo
transporta. Kafedra "Nachertatel'naya geometriya i grafika.

KARASEV, M.A. (Rostov-na-Donu)

Return spring migrations of birds. Priroda 53 no.3:127-128 '64.
(MIRA 17:4)

BODE, Hendrik W.; KOLOSOV, A.A., [translator], redaktor; MEYEROVICH, L.A.,
[translator], redaktor; KARASEV, M.D., redaktor; GESSEN, L.V.,
redaktor; KORNILOV, B.I., ~~tekhnicheskii~~ redaktor.

[Network analysis and feedback amplifier design] Teoriia tsapai i
proektirovanie usilitelei s obratnoi svyaz'iu. Perevod s angliiskogo
i red. A.A.Kolosova i L.A. Meerovicha. Moskva, Gos. izd-vo inostran-
noi lit-ry, 1948. 641 p.
(MIRA 8:5)
(Radio circuits) (Amplifiers, Electron-tube) (Telephone lines)

KARASEV, M. D.

USSR/Physics - Multivibrator transients

Card 1/1

Pub. 129-4/23

Author : Karasev, M. D., and Selezneva, M. A.

Title : Transient processes in a multivibrator under various regimes

Periodical : Vest. Mosk. un., Ser. fizikomat. i yest. nauk, 9, No ¹⁰ 33-42, Oct 1954

Abstract : The authors employ the qualitative method for investigating multivibrator systems with large nonlinearity, which was developed by USSR radio physicists (A. A. Andronov and S. E. Khaykin, Teoriya kolebaniy [Theory of Oscillations], 1937). They claim that the familiar methods for analyzing the steady-state processes in nonlinear systems by means of the small-parameter technique are ineffective in analyzing systems with large nonlinearity. In this work the authors give a graphical-analytical interpretation of the qualitative method as applied to the multivibrator, and show that in the graphical representation of nonlinear dynamic anode characteristics of tubes it is possible to obtain comparatively simply a quantitative solution to the nonlinear differential equations of the multivibrator and to trace the steady-state process. The authors found one more regime qualitatively distinct from the usual three others; they call it "regime of collapsing self-excited oscillations." Reference: V. V. Vitkevich, "Synchronization of relaxation generators on overtones," Candidate Dissertation, Moscow State University, 1941.

Submitted : March 22, 1954

Abstract : Obtain experimentally the surface waves along a bare copper single conductor and investigate the structure of their fields. Claim that such investigations are of physical interest because the appearance of the surface waves connected with the presence of a boundary of separation between two media in which electromagnetic waves are propagated with different phase velocity.

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000720620003-1

Institution : -

Submitted : April 1, 1953

KARASEV, M. D.

USSR/Physics - Surface electromagnetic waves

FD-437

Card 1/1 : Pub. 153 - 7/18

Author : Karasev, M. D., and Apanasenko, V. A.

Title : ~~Obtaining of surface waves propagating along a single cylindrical conductor~~
Obtaining of surface waves propagating along a single cylindrical conductor

Periodical : Zhur. tekhn. fiz. 24,⁴ 662-666, Apr 1954

Abstract : Obtain experimentally the surface waves along a bare copper single conductor and investigate the structure of their fields. Claim that such investigations are of physical interest because the appearance of these waves is connected with the presence of a boundary of separation between two media in which electromagnetic waves are propagated with different phase velocity.

Institution : -

Submitted : April 1, 1953

KHARKEVICH, Aleksandr Aleksandrovich; KARASEV, M.D. redaktor; MURASHOVA, N. Ya., tekhnicheskii redaktor

[Outline of a general theory of communication] Ocherki obshchei teorii svyazi. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1955.
268 p. (Information theory) (MLRA 8:8)

KARASEV, M. D. Docent

"Propagation of Surface Electromagnetic Waves Along a Conductor," a paper delivered at the Section of Radiophysics, Physics Faculty, Conference on Radiophysics, Moscow State U., 10-14 May 55, Vest. Mosk. U., Ser. Fiz-Mat. i Yest. Nauk, No.6, 1955

Sum. 900, 26 Apr 56

POPOV, Aleksandr Stepanovich [deceased]; RADOVSKIY, M.I.; BERG, A.I.,
red.; KARASEV, M.D., red.; AKHLAMOV, S.N., tekhn.red.

[Wireless telegraphy; collection of articles, reports, letters,
and other materials] O besprovolochnoi telegrafii; sbornik
statei, dokladov, pisem i drugikh materialov. Pod red. i so
vstup.stat'ei A.I.Berga. S primechaniami M.I.Radovskogo.
Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1959. 218 p. (MIRA 12:12)
(Telegraph, Wireless)

AUTHORS: Karasev, M.D., Sukhov, A.M.

S/055/59/000/04/013/026
B014/B005

TITLE: On Even Harmonics in a Nonlinear Oscillation Circuit With Odd Nonlinearity

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1959, Nr 4, pp 123-129 (USSR)

ABSTRACT: The oscillation circuit shown by figure 1 with nonlinear inductance without field magnetization is analyzed. It is investigated whether even harmonics exist in this circuit. The method of successive approximation is applied which considers any degree of smallness. The differential equation (1) is the equation for the forced oscillation generated by a sinusoidal voltage applied to the oscillation circuit. Under consideration of the dependence between the magnetic flux and the current according to formula (1), and by introduction of the quantities (3), the differential equation (4) is obtained from differential equation (1) by differentiating with respect to time; the solution of (4) is found by the series formula (5). It is shown for the resonance case that no even harmonics appear either at the same order of smallness of nonlinearity and attenuation or at different orders with any approximation. The same results are obtained if the relation $\omega_0 \approx k\omega$ ($k = 2, 3, \dots$) holds between the circular frequency ω_0 of the resonance frequency of the

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9(3), 9(4), 24(3)

SOV/53-69-2-3/10

AUTHOR: Karasev, M. D.

TITLE: Some General Properties of Nonlinear Reactive Elements

PERIODICAL: Uspekhi fizicheskikh nauk, 1959, Vol 69, Nr 2, pp 217-267
(USSR)

ABSTRACT: The present very detailed paper in nearly text-book-like form gives a survey of the properties and the possibilities of applying nonlinear reactive elements in the field of electronics. In the introduction the fundamental basic concepts used are formulated, and a number of definitions is given in a very illustrative form (nonlinearity of the volt-ampere characteristic of the element (Figs 1,2,3); capacitance, resistance, modulation; discussion of various basic circuits; it is shown that, with a purely reactive element, also if it is nonlinear, it is not possible to obtain direct current from alternating current, and that it is also impossible to transform direct current into alternating current by a system consisting of any combination of nonlinear reactive elements and constant resistances). Chapter 2 deals with the general energy relations of nonlinear reactive elements. In this chapter the application

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Some General Properties of Nonlinear Reactive Elements

of nonlinear reactive elements as modulators in magnetic and dielectric devices is discussed, and several special problems of modulation are theoretically explained. Chapter 3 deals with the analysis of reactive modulators by the method of the small signal. The description is taken essentially from western publications (Refs 13-16). Theoretical considerations are applied to the example of a two-circuit reactive modulator (Fig 15). Further, a non-reversing modulator with summation of the combination frequency $\omega_2 = \omega_0 + \omega_1$ is discussed, and also a reversing modulator for which $\omega_2 = \omega_0 - \omega_1$ holds. The theory of these two circuits is given and discussed. In the following, a parametric amplifier with negative input conductivity (Fig 17) is theoretically dealt with, as also the noises of an amplifier with negative conductivity; as shown by analysis, the total output noise may be considered to be additively composed of 8 components. Chapter 4 deals with the investigation of the form of nonlinear capacitance in a crystal diode in p-n transition, and § 5 mentions some new possibilities of applying nonlinear reactive elements, partly taken from the periodical PIRE

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Some General Properties of Nonlinear Reactive Elements

(June 1958) and partly from other western publications. The following is dealt with in detail: A reactive wide-band amplifier with low noise level (block scheme figure 27), the experimental characteristics of a microwave parametric amplifier on a semiconductor diode (Fig 28), the measurement of the noise factor of two types of amplifiers with pulsating reactivity in which semiconductor diodes are used (Figs 29,30). In this connection the lectures by V. S. Etkin and Ye. M. Gershenson which were held at the third All-Union Conference of the MVO SSSR on radioelectronics (Kiyev, January 23, 1959) were mentioned, who work at the laboratory of Professor N. N. Malov at the Moskovskiy gosudarstvennyy pedagogicheskiy institut im. V. I. Lenina (Moscow State Pedagogical Institute imeni V. I. Lenin) in the field of parametric amplifiers. In the following a parametric electron beam amplifier (Fig 31, Ref 28 - PIRE) is discussed, and its properties are explained on the basis of diagrams. The following Soviet scientists are mentioned in this paper: L. I. Mandel'shtam, N. D. Papaleksi, G. S. Gorelik, V. Ye. Bogolyubov, B. M. Vul, V. I. Samoylenko, I. A. Glotov, A. L. Mikaelyan, A. A. Andronov, A. A. Vitt,

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SOV/53-69-2-3/10

Some General Properties of Nonlinear Reactive Elements

V. P. Gulyayev, M. A. Divil'kovskiy, V. A. Lazarev, V. V. Migulin, Ye. M. Rubchinskiy, S. M. Rytov, I. T. Turbovich, and K. F. Teodorchik. There are 36 figures, 1 table, and 35 references, 15 of which are Soviet.

Card 4/4

KAPTSOV, N.A., prof.; GVOZDOVER, S.D., prof.; LOPUKHIN, V.M., dotsent;
SPIVAK, G.V., prof.; DUBININA, Ye.M., assistant; ZAYTSEV, A.A.,
dotsent; SOLNTSEV, G.S., assistant; LUK'YANOV, S.Yu., prof.,
retsenzent; KARASEV, M.D., dotsent, retsenzent; YERMAKOV, M.S.,
tekhn.red.

[Electronics and radio physics] Radiofizicheskaya elektronika.
Moskva, Izd-vo Mosk.univ., 1960. 561 p. (MIRA 13:10)
(Electronics) (Radio)

83431

S/188/60/000/001/006/C10

B019/B056

9.1400

AUTHORS: Karasev, M. D., Kovalenko, A. A., Sludskiy, V. N.

TITLE: A New Lecture-demonstration of the Propagation of Electro-magnetic Waves Along a Line

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya 3, fizika, astronomiya, 1960, No. 1, pp. 66 - 69

TEXT: The system described in the present paper is shown in Fig. 1. It consists of a high-frequency generator, whose energy is fed into a copper wire by means of a coaxial cable and a tuned cone. The energy propagates in the conductor as a symmetric surface wave with a field structure that is equal to that in the coaxial cable, and is shown in Fig. 2. The H_p -component of the magnetic field is determined by means of a frame antenna with a detector and a galvanometer. The following may be demonstrated by means of this device: The equivalence of the displacement currents and the conduction current, the field structure can be better demonstrated than by means of a Lecher system, and the scattering of

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A New Lecture-demonstration of the Propagation of Electromagnetic Waves Along a Line S/188/60/000/001/006/010
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waves on conductor inhomogeneities may be studied. In the course of demonstrations made at the fizicheskiy fakul'tet MGU (Department of Physics of Moscow State University) a wavelength of 10 cm and a power of 2 w were used. There are 3 figures and 3 references: 2 Soviet and 1 US.

ASSOCIATION: Kafedra teorii kolebaniy (Chair of the Theory of Oscillations)

SUBMITTED: September 12, 1959

X

Card 2/2

S/188/61/000/002/003/010
B113/B203

9.2572

AUTHORS: Il'inskiy, Yu.A., Karasev, M.D.

TITLE: Study of transition processes in a two-circuit parametric transformer with sum and difference output frequency

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya 3, fizika, astronomiya, no. 2, 1961, 12 - 18

TEXT: First, the authors analyze the transition processes. According to Ref. 1 (Karasev, M.D. UFN, LXIX, vyp. 2, 1959), a two-circuit parametric transformer can be described by a system of equations,

Eq. (1) $\ddot{x}_1 + \omega_1^2 x_1 = 2\alpha_1 x_1 + \alpha_1 f(\omega t)(x_1 + x_2) + e_1$. The frequency of the parametric change ω by the relation $\omega = \omega_2 \pm \omega_1 \pm \Delta$ is related to the circuit frequencies. The upper sign holds for a rotating (difference) modulator, the lower one for a non-rotating (sum) modulator; Δ is a slight mis-tuning. The external force is supposed to be introduced in one circuit only so that the slowly variable, complex amplitude E_2 of the external

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S/188/61/000/002/003/010
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Study of transition processes ...

force vanishes and the frequency $p = \omega_1 + j\Delta_1$. The damping factor of oscillations after switching off the external signal is obtained from Eq. (2)

$$\begin{aligned} x_1' &= |z_1^{(1)}| e^{\operatorname{Re} \lambda_1 t} \cos \left[\left(\omega_1 + \frac{\Delta}{2} + \operatorname{Im} \lambda_1 \right) t + \arg z_1^{(1)} \right] + \\ &+ |z_2^{(1)}| e^{\operatorname{Re} \lambda_2 t} \cos \left[\left(\omega_1 + \frac{\Delta}{2} + \operatorname{Im} \lambda_2 \right) t + \arg z_2^{(1)} \right], \\ x_2' &= |z_1^{(2)}| e^{\operatorname{Re} \lambda_1 t} \cos \left[\left(\omega_2 + \frac{\Delta}{2} + \operatorname{Im} \lambda_1 \right) t + \arg z_1^{(2)} \right] + \\ &+ |z_2^{(2)}| e^{\operatorname{Re} \lambda_2 t} \cos \left[\left(\omega_2 + \frac{\Delta}{2} + \operatorname{Im} \lambda_2 \right) t + \arg z_2^{(2)} \right]. \end{aligned}$$

$$z_1^{(1)} = \frac{E}{2j\omega_1(\lambda_1 - \lambda_2)} \frac{\lambda_1 + j\frac{\Delta}{2} + \lambda_k}{\lambda_1 + j\frac{\Delta}{2} - j\Delta_1}$$

$$z_2^{(1)} = \mp \frac{E}{2j\omega_1(\lambda_1 - \lambda_2)} \frac{j\omega_1 \mp 1}{2\omega_2} \frac{1}{\lambda_1 + j\frac{\Delta}{2} - j\Delta_1}$$

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Study of transition processes ...

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and the formation of oscillations after switching on the external force proceeds by the law $x_1^t = x_1^{(0)}(t) - x_1^s(t)$, the steady solution $x_1^{(0)}$ having the form of Eq. (3)

$$x_1^{(0)} = |z_1^{(0)}| \cos(p t + \arg z_1^{(0)}),$$

$$x_2^{(0)} = |z_2^{(0)}| \cos[(\omega \mp p)t \mp \arg z_2^{(0)}],$$

$$z_1^{(0)} = \frac{E}{2j\omega_1} \frac{b_2 - j(\Delta - \Delta_1)}{\left(\lambda_1 + j\frac{\Delta}{2} - j\Delta_1\right)\left(\lambda_2 + j\frac{\Delta}{2} - j\Delta_1\right)} =$$

$$= \frac{E}{2j\omega_1} \frac{b_2 - j(\Delta - \Delta_1)}{(b_1 + j\Delta_1)(b_2 - j(\Delta - \Delta_1)) \mp \frac{a_1 a_2}{4\omega_1 \omega_2} |f_1|^2},$$

$$z_2^{(0)} = \pm \frac{E}{2j\omega_1} \frac{j a_2 f \mp 1}{2\omega_2} \frac{1}{\left(\lambda_1 + j\frac{\Delta}{2} - j\Delta_1\right)\left(\lambda_2 + j\frac{\Delta}{2} - j\Delta_1\right)} =$$

$$= \pm \frac{E}{2j\omega_1} \frac{j a_2 f \mp 1}{2\omega_2} \frac{1}{(b_1 + j\Delta_1)(b_2 - j(\Delta - \Delta_1)) \mp \frac{a_1 a_2}{4\omega_1 \omega_2} |f_1|^2}.$$

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Study of transition processes ...

The trajectories of the roots $\lambda_{1,2}$ characteristic of transition processes and steady behavior having the form of Eq. (A)

$$\lambda_{1,2} = -\frac{\delta_1 + \delta_2}{2} \pm \sqrt{\frac{1}{4}(\delta_1 - \delta_2 + j\Delta)^2 + \frac{\alpha_1 \alpha_2}{4\omega_1 \omega_2} |f_1|^2}, \text{ where } f_1 \text{ is determined}$$

by the Fourier expansion of the function $f(\omega t) = \sum_k f_k e^{i k \omega t}$, are shown in Figs. 1 and 2 in the complex plane with a change in the parameter Δ and

$$k^2 = \frac{\alpha_1 \alpha_2}{4\omega_1 \omega_2} |f_1|^2. \text{ The trajectories of } \lambda_2 \text{ are on the left, those of } \lambda_1$$

on the right of $-\frac{\delta_1 + \delta_2}{2}$; the trajectories of the rotating modulator

are within $-\delta_2$ and $-\delta_1$, those of a non-rotating modulator are without. On

the basis of Eq. (2) and Eq. (3) and Figs. 1 and 2, the following has been found: In a rotating modulator, the transition process is the sum of two damped harmonic oscillations (with switched-off external signal), or the sum of two damped and one steady oscillation (with switched-on exter-

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Study of transition processes ...

nal force). For a non-rotating modulator, it follows from Eq. (3), that the frequency characteristic of the amplifier is represented by the product of the frequency characteristics of individual circuits. Experiments dealt with a low-frequency parametric transformer with circuit frequencies of about 100 and 400 kc/sec. In conformity with Eq. (2), the transition processes had two constant times, and pulsations in the transition processes were observed in the case of mistuning. Further, it was found that the duration of the transition process, in the case of large K, was proportional to K (K being the voltage amplification factor in the first circuit of a regenerative transformer). The duration of the transition process was the time during which the oscillation amplitude attained the $(1 - e^{-1})$ -fold of its steady value. In a non-rotating modulator, the duration of the transition process dropped monotonically with increasing k^2 in both circuits. The time of formation in the second circuit was slightly longer than in the first one due to a slow increase of oscillations in the second circuit at the beginning of the formation process. There are 6 figures and 1 Soviet-bloc reference. ✓

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9.2572

S/188/61/000/006/001/007
B108/B138

AUTHORS: Il'inskiy, Yu. A., Karasev, M. D.

TITLE: Double-tuned parametric oscillator with external feed

PERIODICAL: Moscow Universitet. Vestnik. Seriya III. Fizika,
astronomiya, no. 6, 1961, 3 - 11

TEXT: A double-tuned parametric amplifier operates as an oscillator if the feed amplitude is high enough. A self-excited oscillator whose amplitude is limited by a non-linear resistor in one of its circuits is considered. Synchronization of the oscillator with an external force is also dealt with. In experimental investigations, the authors used a parametric oscillator with frequencies of 100 and 400 kcps in the two circuits, with semiconducting diodes of the types ДГЦ-27 (DGTs-27) and Д809 (D809) serving as nonlinear capacity. It was found that the amplitude is limited either by a nonlinear resistance or by a dependence of the parametric connection between the circuits on amplitude fluctuations. Perturbations that are due to the nonlinear reactance lead to a

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9.9572

AUTHOR: Karasev, M.D.

TITLE: The influence of parasitic parameters of a semi-conductor diode on the performance of a parametric amplifier

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 5, 1961,
779 - 788

TEXT: In the design of parametric amplifiers with a non-linear reactance, it is usually assumed that this reactive element has no parasitic parameters (Ref. 1: H.E. Rowe, Proc. I.R.E. 1958, 46, 5, 850), (Ref. 2: S. Bloom, K. Chang, RCA Rev. 1957, 18, 4, 578), (Ref. 3: H. Heffner, G. Wade, J. Appl. Phys. 1958, 29, 9, 1321) or, at the best, only its losses are taken into consideration (Ref. 4: D. Leenov, Bell System Techn. J. 1958, 37, 4, 989). In a microwave diode, however, of standard construction, whose equivalent cct is

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shown in Fig. 1b, the conductance g_p is normally neglected at high frequencies, if the diode is strongly back biased, so that losses in the diode are determined mostly by series base resistance R_s . This is not always correct. At high frequencies, the base resistance R_s and the p-n junction capacitance practically do not vary with frequency, while as determined from the experiment losses in the p-n junction they are frequency dependent and in order to approximate them R_s has to be made variable. At very high frequencies, the dielectric losses of the semi-conductor are added to the losses of the base conductance. These losses are frequency dependent and concentrate in the region of the depletion region of the p-n junction and should, therefore, be represented as a conduction, which depends on frequency and on the junction capacitance. In the present article, the author derives general equations for a double contour parametric amplifier, taking into account all parasitic parameters, including the parasitic inductance of the diode as shown in Fig. 1b. The equivalent cct. of the amplifier is shown in Fig. 4. In it g_s is the conductance of the harmonic signal source, the equivalent

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conductance g_{c1} includes losses and L_1 , C_1 represent the susceptance of the input cct with g_{c2} , L_2 and C_2 respectively in the output cct. The capacitance $C(t)$ varies in accordance with the pumping frequency

$$C = C_0(1 + m \cos \omega_0 t) \equiv C_0 + \frac{\Delta C}{2}(e^{j\omega_0 t} + e^{-j\omega_0 t}), \quad (1)$$

where C_0 - the average value of capacitance; m - modulation depth, $\Delta C = mC_0$ - amplitude of fluctuation of the p-n junction capacitance. Using the impedance method of M.D. Karasev (Ref. 6: Uspekhi Fiz. Nauk, 1959, LXIX, 2, 217) the following system of 3 equations can be obtained for the steady state solution

$$\left. \begin{aligned} Y_1 U_1 + j\omega_1 \frac{\Delta C}{2} U_2 + j\omega_1 \frac{\Delta C}{2} U_3^* &= I, \\ j\omega_2 \frac{\Delta C}{2} U_1 + Y_2 U_2 + 0 &= 0, \\ -j\omega_3 \frac{\Delta C}{2} U_1 + 0 + Y_3^* U_3^* &= 0. \end{aligned} \right\} \quad (12)$$

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in which the following notation has been used (according to Fig. 4)

$$Y_1 = g_p(\omega_1) + j\omega_1 C_0 + \frac{1}{R_s(\omega_1) + j\omega_1 L + \frac{1}{g_s + g_{c1} + j\left[\omega_1(C_1 + C') - \frac{1}{\omega_1 L_1}\right]}}$$

$$Y_2 = g_p(\omega_2) + j\omega_2 C_0 + \frac{1}{R_s(\omega_2) + j\omega_2 L + \frac{1}{g_L + g_{c2} + j\left[\omega_2(C_2 + C') - \frac{1}{\omega_2 L_2}\right]}}$$

$$Y_3 = g_p(\omega_3) + j\omega_3 C_0 + \frac{1}{R_s(\omega_3) + j\omega_3 L}$$

$$I = \frac{1}{1 + [R_s(\omega_1) + j\omega_1 L] \left\{ g_s + g_{c1} + j\left[\omega_1(C_1 + C') - \frac{1}{\omega_1 L_1}\right] \right\}} I_s$$

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In Eq. (12) the possibility of varying diode losses at different frequencies is taken into account. For small signals the cct in Fig. 4 can be represented as three ccts of Fig. 5: For the input frequency ω_1 (Fig. 5a), for the output frequency ω_2 (Fig. 5b) and at the difference frequency ω_3 of the parasitic coupling (Fig. 5c).

In Fig. 5a, admittances Y_{12} and Y_{13} are complex, introduced by the parametric coupling between the output and the cct at the difference frequency by the parasitic parameters and are expressed by

$$Y_{12} = \frac{\omega_1 \omega_2 \left(\frac{\Delta C}{2}\right)^2}{Y_2} \quad (13), \quad Y_{13} = - \frac{\omega_1 \omega_3 \left(\frac{\Delta C}{2}\right)^2}{Y_3} \quad (14)$$

respectively. From the equivalent cct of Fig. 5a it is easy to find the input impedance of the amplifier Z_{in}

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$$Z_{in} = \frac{R_s(\omega_1) + j\omega_1 L + \dots}{1 + [R_s(\omega_1) + j\omega_1 L] \left\{ g_s + g_{d1} + j \left[\omega_1 (C_1 + C') - \frac{1}{\omega_1 L_1} \right] \right\}} \rightarrow \dots \quad (15)$$

$$+ \frac{Y_{1,2} \left\{ 1 + [R_s(\omega_1) + j\omega_1 L] \left\{ g_s + g_{d1} + j \left[\omega_1 (C_1 + C') - \frac{1}{\omega_1 L_1} \right] \right\} \right\}}{1 + [R_s(\omega_1) + j\omega_1 L] \left\{ g_s + g_{d1} + j \left[\omega_1 (C_1 + C') - \frac{1}{\omega_1 L_1} \right] \right\}}$$

where

$$Y_{1,2} = Y_1 + Y_{12} + Y_{13}$$

In Fig. 5b the input current I_2 is given by

$$I_2 = -j\omega_2 \frac{\Delta C}{2} U_1 \quad (16)$$

and the output voltage U_{out} by

$$U_{out} = \frac{I_2}{Y_2} \frac{1}{1 + [R_s(\omega_2) + j\omega_2 L] \left\{ g_s + g_{d2} + j \left[\omega_2 (C_2 + C') - \frac{1}{\omega_2 L_2} \right] \right\}} \quad (17)$$

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In the equivalent cct of Fig. 5c the input current I_3^* is given by

$$I_3^* = -j\omega_3 \frac{\Delta C}{2} U_1. \quad (18)$$

and the resulting power gain is given by

$$G = \frac{P_{out}}{P_{in}} = \frac{4g_c g_n \omega_1 \omega_2 \left(\frac{\Delta C}{2}\right)^2}{|Y_{1, out}|^2 |Y_2|^2 \left[1 + |R_s(\omega_2) + j\omega_2 L| \left\{g_n + g_c + j\left[\omega_2(C_2 + C') - \frac{1}{\omega_2 L_2}\right]\right\}\right]} \quad (19)$$

Using the same methods and by introducing noise generators the noise figure of the amplifier could be found. As an example, an amplifier with the following characteristics is analyzed. Signal frequency $\nu_1 = \omega_1/2\pi = 10^3$ Mc/s, pumping frequency $\nu_0 = \omega_0/2\pi = 10^4$ Mc/s, with conditions as given in

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$$\left. \begin{aligned} R_s &\ll \frac{1}{\omega C_0}, \\ g_p &\ll \omega C_0, \\ m &\ll 1, \end{aligned} \right\} \quad (5)$$

Conductances g_{c1} and g_{c2} are neglected. The inductive reactance of the diode at the signal frequency $\omega_1 L \approx 20$ ohms, small as compared with that of the average capacity $\frac{1}{\omega_1 C_0} \approx 800$ ohms and is neglected.

Introducing the notation of

$$x = |g \delta p| \sqrt{\frac{g(\omega_1) g(\omega_2)}{\omega_1 \omega_2 (\Delta C/2)^2}}, \quad (28)$$

and

$$\xi_1 = \frac{g_s}{g(\omega_1)}, \quad \xi_2 = \frac{g_s L}{g(\omega_2)}, \quad \eta = \frac{g(\omega_1) - g_{13}}{g(\omega_1)}, \quad (29)$$

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the expression for power gains is obtained as

$$GX = \frac{\omega_2}{\omega_1} \frac{4\xi_1\xi_2}{x^2 \left[(\xi_1 + \eta)(\xi_2 + 1) + \frac{1}{x^2} \right]^2} \quad (30)$$

Quantity $X = \operatorname{tg} \delta_p$ as given by (28) is called the parametric tangent of loss angle of the fluctuating capacitance of the diode. With no parasitic coupling at the difference frequency ($\eta = 1$) and for perfect matching

$$\xi_1 = \xi_2 = \sqrt{1 + \frac{1}{x^2}}$$

the gain is determined only by the frequency ratio and the value of X

$$G = \frac{\omega_2}{\omega_1} \frac{1}{(x + \sqrt{1 + x^2})^2} \quad (31)$$

Similarly the noise figure F is obtained as

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$$F = 1 + \left[\frac{1}{\xi_1} + \frac{\omega_1 (\xi_1 + \eta)^2}{\omega_2 \xi_1} x^2 + \frac{\omega_1 (1 - \eta)}{\omega_2 \xi_1} \right] \frac{T}{T_0}, \quad (32)$$

where T - temperature of the diode and $T_0 = 290^\circ\text{K}$. For actual values of the diode parameters $C_{\max} = 0.25 \text{ nf}$, $C_{\min} = 0.11 \text{ nf}$, $R_s = 10 \text{ ohm}$, $g_p = 0$, $L = 3 \cdot 10^{-3} \text{ microhenry}$, the value of $x = 0.2$ and for $T = T_0$ the gain G and noise figure F are given by

$$G = \frac{\omega_2}{\omega_1} 0.67 = 7.4 (8.7 \text{ dB}), \quad F = 1.22 (0.80 \text{ dB}) \quad (33)$$

respectively. A.A. Brandt and I.V. Ivanov have carried out experiments [Abstractor's note: Reference not given] with a double cct parametric amplifier with a summing output frequency for which they measured the gain for various values of the diode bias and of pumping power; the output meter was tuned to a sum frequency and was

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connected to the mixer through a beyond-cut-off waveguide, introducing not less than 80 dB attenuation at the pumping and difference frequencies. In this experiment, stable gains in excess of ω_2/ω_1 have been obtained, sometimes exceeding even the excitation of the amplifier. The above analysis shows that parasitic parameters of the semi-conductor diode introduce into the performance of a parasitic amplifier not only losses at working frequencies, but can form additional resonant circuits at frequencies for which the amplifier has not been designed which effect can drastically change the working regime of the amplifier. To avoid this a third cct can be introduced as shown by E.M.T. Jones and J.S. Honda (Ref. 7: IRE Wescon Convention Record, Part I, 1959). The author expresses his thanks to V.V. Migulin for valuable discussions on all problems presented in the article. There are 7 figures, 2 tables and 7 references: 2 Soviet-bloc and 5 non-Soviet-bloc. The references to the English-language publications read as follows: H.E. Rowe, Proc. IRE 1958, 46, 5, 850; S. Bloom, K. Chang, RCA Rev. 1957, 18, 4, 578;

Card 11/44 12

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H. Heffner, G. Wade, J. Appl. Phys., 1958, 29, 9, 1321; D. Leenov,
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ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo
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baniy (Moscow State University im. M.V. Lomonosov.
Faculty of Physics, Department of the Theory of Os-
cillations)

SUBMITTED: January 5, 1960

Card 12/14-12

24895

S/109/61/006/008/015/018
D207/D304

9.2572

AUTHORS: Il'inskiy, Yu.A., and Karasev, M.D.

TITLE: Transients in a two circuit parametric amplifier

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 8, 1961,
1397 - 1400

TEXT: The authors give a short report on the theoretical and experimental analysis of transients in a two circuit parametric amplifier. The theoretical analysis is carried out assuming a small signal. The equivalent ccts of two circuit parametric amplifiers are shown in Fig. 1. These are systems with two degrees of freedom and with periodically varying reactive element. The equations for the above systems may be written as

$$\ddot{x}_i + \omega_i^2 x_i = \mu (-2\delta_i \dot{x}_i + a_i f(\omega t) (x_1 + x_2) + c_i). \quad (1)$$

where $i = 1, 2$ the index related to either the first or the second

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Transients in a two circuit ...

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circuit; e_1 - external driving force; $e_2 = 0$; μ - a small parameter; σ - attenuation of the i -th circuit; f - a periodic function with period 2; ω - the frequency of change of the parameter. It follows from Eq. (1) that the cct attenuation and modulation depth are assumed to be small, so that the Q of the circuits is high and parametric coupling weak; oscillations in the system are very nearly harmonic. The constant coupling may be large. Eq. (1) can be solved by one of the quasi-linear methods, e.g. by averaging. Eq. (1) is first reduced to standard form by assuming $\omega = \omega_1 + \omega_2$ and putting

$$x_i = Z_i' e^{j\omega_1 t} + Z_{-i}' e^{-j\omega_1 t}, \quad \dot{x}_i = j\omega_1 (Z_i' e^{j\omega_1 t} - Z_{-i}' e^{-j\omega_1 t}),$$

where $i = 1, 2$; $Z_{-i}' = Z_i'^*$ - complex amplitudes, so that after averaging the shortened form

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$$\begin{aligned} \dot{z}_1 = \mu \left\{ -(\delta_1 + j\Delta_1 + \frac{j\alpha_1 f_0}{2\omega_1})z_1 - \frac{j\alpha_1 f_1}{2\omega_1}z_{-2} + \frac{E}{2j\omega_1} \right\}, \quad \dot{z}_{-2} = \mu \left\{ -(\delta_2 - \right. \\ \left. - j\Delta_2 - \frac{j\alpha_2 f_0}{2\omega_2})z_{-2} + \frac{j\alpha_2 f_{-1}}{2\omega_2}z_1 \right\} \end{aligned} \quad (2)$$

is obtained where f_0, f_1, f_{-1} - the Fourier coefficients of function $f(\omega t)$

$$f(\omega t) = \sum_{k=-\infty}^{k=+\infty} f_k e^{j\omega k t}.$$

It is assumed further that $f_0 = 0$ since

$$\Delta_1 = \Delta_1 + \frac{\alpha_1 f_0}{2\omega_1}$$

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Transients in a two circuit ...

can be introduced and the detuning due to the constant component of coupling thus taken into account, the solution of linear equations (2) with constant coefficients is easily found for any external force E and any initial conditions. E.g. the transient state can be determined, i.e., the presence of oscillations in the system; when $E = \text{constant}$ and initial condition $Z_1(0) = 0$ the equations have then the shape of matrix

$$\dot{Z} = AZ + B, \\ Z = \begin{pmatrix} Z_1 \\ Z_2 \end{pmatrix}, \quad B = \mu \frac{B}{2j\omega_1} \begin{pmatrix} 1 \\ 0 \end{pmatrix}.$$

Its solution, satisfying the initial conditions $Z(0) = 0$ is

$$Z = \int_0^t e^{A(t-s)} B(s) ds = \\ = \frac{1}{\mu^2 (\lambda_2 - \lambda_1)} \left\{ \frac{1 - e^{\mu \lambda_1 t}}{\lambda_1} [AB - \lambda_2 B] - \frac{1 - e^{\mu \lambda_2 t}}{\lambda_2} [AB - \lambda_1 B] \right\}, \quad (3)$$

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Transients in a two circuit ...

It follows that in a two circuit parametric amplifier the time of establishment of the steady state does not depend on the relationship between the phase of the suddenly applied signal and the phase of pulsed variation of the parameter, that at optimum tuning ($\Delta_1 = \Delta_2 = 0$) the characteristic roots are real. With $f_1 = 0$ (no varying parameter) these are essentially equal to $-\delta_1$ and $-\delta_2$ and diverge symmetrically with respect to the centre of (δ_2, δ_1) with increasing $|f_1|$. When the smaller of the roots (absolute value) reaches zero the system becomes self oscillating. When this root assumes smaller absolute values then the duration of the transient process increases. Finally with the detuning of the roots (Δ_1 or $\Delta_2 \neq 0$), then $\text{Im } \lambda_{1,2} \neq 0$ and the transient contains damped oscillations. The theory was experimentally applied to a balanced parametric amplifier with its first port tuned to 100 Kc/s and its se-

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Transients in a two circuit ...

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D207/D304

cond to about 500 Kc/s. Diodes ДГЧ -25 (DGTs-25), ДГЧ -27 (DGTs-27) and Д-809 (D-809) where used as variable capacitances. The duration of the transient is approximately proportional to the voltage gain of the amplifier. There are 5 figures, 7 references: 3 Soviet-bloc and 4 non-Soviet-bloc. The references to the English-language publications read as follows: J.M. Manley, H.E. Rowe, Proc. I.R.E., 1956, 44, 7, 904; H.E. Rowe, Proc. I.R.E., 1958, 46, 5, 850; H. Heffner, G. Wade, J. Appl. Phys. 1958, 29, 9, 1321; S. Bloom, K. Chang, RCA Rev., 1957, 18 December, 578.

ASSOCIATION: Fizicheskii fakul'tet Moskovskogo gosudarstvennogo universiteta im M.V. Lomonosova (Moscow State University im. M.V. Lomonosov, Faculty of Physics)

SUBMITTED: June 1, 1960

Card 6/7

IL'INSKIY, Yu.A.; KARASEV, M.D.

Investigating transient processes in two-circuit parametric converters with sum or difference output frequencies. Vest. Mosk. un. Ser. 3 Fiz., astron. 16 no.2:12-18 Mr-Apr '61. (MIRA 14:6)

1. Kafedra teorii kolebaniy Moskovskogo gosudarstvennogo universiteta.

(Transients(Electricity))

(Electric current converters)

IL'INSKIY, Yu.A.; KARASEV, M.D.

Two-circuit parametric oscillator with external pumping. Vest.
Mosk. un. Ser. 3: Fiz., astron. 16 no.6:3-11 N-D '61. (MIRA 14:12)

1. Kafedra teorii kolebaniy Moskovskogo universiteta.
(Oscillators, Electric)

KHOLODOVSKIY, G.Ye.; SMIRNOV, A.D.; KARASEV, M.D.; YAKOVLEV, K.P.,
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(MIRA 15:3)

(Physics)

(Technology)

9,2580 (2301)

37423

S/188/62/000/002/009/013
B154/B102

AUTHORS: Karasev, M. D., Kao Pao-Hsin

TITLE: Amplification and noise of a parametric three-frequency converter with summary frequency output

PERIODICAL: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 2, 1962, 68-73

TEXT: Previous investigations showed that it is possible to enlarge the amplification factor of a two-frequency converter by a regenerating circuit with a third frequency equal to the difference of the two frequencies. The amplification factor G and the noise ratio F of the system shown in Fig. 1 are determined as functions of the resistance R_3 of the regenerating circuit and the capacity modulation $m = \Delta C/C_0$. ΔC is the amplitude of the cosinusoidal capacitance variation of the parametric diode with the pumping frequency ω_0 . If

$\xi_1 = \xi_2 = \sqrt{1 + 1/x^2}$, then

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Amplification and noise of a

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$$Y_{12} = - \frac{\omega_1 \omega_2 (\Delta C/2)^2}{Y_3} \quad (18)$$

$$F = 1 + \left[\frac{1}{\xi_1} + \frac{\omega_1 (\xi_1 + 1 - \beta)^2}{\omega_2 \xi_1} x^2 + \frac{\omega_1 \beta}{\omega_2 \xi_1} \right] \frac{T}{T_0} \quad (21) \text{ with}$$

$$x = \operatorname{tg} \delta_n = \sqrt{\frac{g_1 g_2}{\omega_1 \omega_2 (\Delta C/2)^2}} \quad (16)$$

$$\xi_1 = \frac{g_c}{g_1}, \quad \xi_2 = \frac{g_n}{g_2}, \quad \beta = \frac{g_{12}}{g_1} \quad (17)$$

$$G = \frac{\omega_2}{\omega_1} \frac{1}{(x + \sqrt{1+x^2})^2} \quad (20).$$

If the system contains no regenerating circuit, F will drop monotonically with increasing ω because the tangent of the parametric loss angle

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40944

S/109/62/007/007/012/018
D266/D308

9.2572

AUTHORS: Kao Pao-hsin, Ivanov, I. V. and Karasev, M. D.
TITLE: Experimental investigation of a microwave three-circuit parametric converter
PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 7, 1962, 1152-1156

TEXT: The paper is concerned with a parametric converter which can produce both the sum and difference frequencies. The converter circuit is described in detail. The signal circuit is of the coaxial type which is protected by a choke against the field of other frequencies. In the experiments the signal frequency is 930 Mc/s and the pumping frequency 8330 Mc/s. Conversion gain increases with increasing pumping power and with increasing coupling to the difference frequency circuit. Noise figure has a minimum at a certain pumping power and decreases if the diode is cooled. Bandwidth decreases with increasing gain. It is also found, in accordance with R. D. Weglein (Trans. I.R.E. MTT-8, 1960, 5), that the

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Experimental investigation of ...

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reverse current of the diode significantly increases the noise.
The main advantages of this converter are that it is insensitive
to load variation, has a relatively large gain, and the circuits
can be independently tuned. There are 7 figures. iX

ASSOCIATION: Fizicheskiy fakultet Moskovskogo gosudarstvennogo
universiteta im. M. V. Lomonosova (Department of
Physics, Moscow State University im. M. V. Lomonosov)

SUBMITTED: November 10, 1961

Card 2/2

GAO BAO-SIN' [Kao Pao-hsin]; IVANOV, I.V.; KARASEV, M.D.

Experimental study of a three-stage parametric microwave converter. Radiotekh. i elektron 7 no.7:1152-1156 '62. (MIRA 15:6)

1. Fizicheskii fakul'tet Moskovskogo gosudarstvennogo universiteta imeni Lomonosova, kafedra teorii kolebaniy.
(Microwaves)

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Measurement of amplitude fluctuations of a frequency multiplier
using a nonlinear resistance. Radiotekh. i elektron. 7
no.11:1964-1966: N '62. (MIRA 15:11)

1. Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo
universiteta im. M.V. Lomonosova.
(Frequency multipliers)

KARASEV, M.D.; GAO BAO-SIN' [Kao Pao-hsin]

Amplification and noises in a three-element parametric converter
with composite output frequency. Vest.Mosk.un.Ser.3.Fiz.,astron.
17 no.2:68-73 Mr-Apr '62. (MIRA 16:2)

1. Kafedra teorii kolebaniy Moskovskogo universiteta,
(Frequency changers)

VYAL'TSEV, A.O.; IVANOV, I.V.; KARASEV, M.D.; POTEKIN, V.V.

Measurement of the noise of frequency multipliers using a
transistor diode. Radiotekh.i elektron. 8 no.2:349-351 F '63.
(MIRA 16:2)

1. Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta,
kafedra teorii kolebaniy.

(Frequency multipliers--Noise)
(Radio measurements)

KARASEV, M.F.

SA

621.313.2.047.2

1966. Experimental investigation on a model of the commutation process of d.c. machines. KARASEV, M.F. *Elektricheskoe* (No. 7) 37-42 (July, 1966) In Russian.—Investigation on a special model enabled the different phases of the process to be studied separately, furthermore, in the absence of a commutating field, and of mutual induction between the sections. The tests show that the influence of the inductance of the sections, load current and collector speed at c.d.'s on the brushes of > 5-6 A does not at all agree with the classical theory of the commutation process, owing to ionic processes in the contact layer of the brushes. B. F. K.

Cond Tech Sci.
Tomsk Electro-Mechanic Inst of Engrs. of R.R. Transport

ASB-SEA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
PRECEDENCE AND PRIORITY INDEX																																																			
<div style="display: flex; justify-content: space-between;"> <div> <p>KHARASEV, M. F.</p> <p>A</p> </div> <div> <p>2064. Nature of brush contact in direct-current machines. KHARASEV, M. F. Elektromashiny (No. 10) 36-42 (Oct., 1948) In Russian.—See Abstr. 1050- (1949) dealing with experimental work on commutation. Commutation processes are analyzed, and among the conclusions derived is a deviation from the classical theory, in that the commutating poles in d.c. machines do not compensate for the reactance voltage, but displace its peaks from trailing to leading edges of the brush.</p> <p style="text-align: right;">w. w. G.</p> </div> </div>																																																			
<div style="display: flex; justify-content: space-between;"> <div> <p>ASAC-SLA</p> <p>1000</p> <p>1000</p> </div> <div> <p>DETAILS</p> <p>1000</p> <p>1000</p> </div> <div> <p>1000</p> <p>1000</p> <p>1000</p> </div> </div>																																																			

KARASEV, N. F.

36678. Karasev, N. F. K voprosu o nastroyke kommutatsii mashin postoyannogo taka. Trudy Tomskogo elektromekhan. In-ta inzhenerov zh-D. Transporta, T. XIV, 1948, c. 3-8

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KARASEV, M. F.

36680. Karasev, M. F. Issledovaniye Granitsy "inversii" elektricheskikh razryakov
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SO: Letopis' Zhurnal'nykh Statey, ^V ol. 50, Moskva, 1949

KARASEV, M. F.

"The Problem of Commutation Design in D.C.Machines," Elektrichestvo, No.7, 1949

Tomsk Electromechanic Inst for Railway Transport Engineers.

USSR/Electricity - Contactors
Arc Quenching
Sep 50

"Problem of the Existence of Inversion in Electric
Discharges in Installations With Vibrating Contacts,"
Docent M. F. Karasev, Cand Tech Sci, Engineers V. A.
Paleyev, V. P. Ubeyev, Tomsk Electromech Inst of RR
Transp

"Elektrichestvo" No 9, pp 58-60

Examines experimentally B. R. and N. I. Lazarenko's
theory of inversion of electric discharges, espe-
cially processes occurring in region demarcated by
arc-formation curve. Concludes it is incorrect to

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USSR/Electricity - Contactors (Contd) Sep 50

quench arc with very large capacitances which com-
pletely remove electric discharge accompanying
process of opening circuit, thus shortening service
life of contact system.

KARASEV, M. F., Docent

167T43

KARASEV, M. F.

KARASEV, M. F. -- "Commutation Process in Direct-Current Electric Machines."
Sub 30 May 52, Moscow Order of Lenin Power Engineering Inst. imeni V.M. Molotov
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SO: Vechernaya Moskva, January -December 1952

KARASEV, Mikhail Fedorovich.

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Equations for current and e.m.f. curves during switching in
collector machines. Elektrichestvo no.12:70-74 D '57. (MIRA 10:12)
(Electric switchgear) (Electric circuits)

8 (5)

AUTHORS:

Karasev, M. F., Doctor of Technical
Sciences, Professor, Suvorov, V. P., Engineer (Tomsk)

SOV/105-59-12-11/23

TITLE:

Study of Spark Formation on Commutators ^a

PERIODICAL:

Elektrichestvo, 1959, Nr 12, pp 50-54 (USSR)

ABSTRACT:

In the adjustment of the brushes of commutators it is of importance to be able to form an opinion not only on the degree of spark formation, but also on the quality of the brushes, to be able to clarify the character of spark distribution and the origin of breakdown. The methods used at present (Refs 1, 2, 3, 4) are listed. None of these methods meets the requirements. The article contains a new method for the study of commutation. The method proved satisfactory in a series of tests on machines of different types. The method consists of the following: the spark-formation indicator II-1 is connected to the working and the auxiliary brush. The auxiliary brush is fixed on the heel of the working brush. The indicator has one electron tube, on which the voltage impulses between the brush and the commutator segments can be observed. The indicator has a block in which all voltage impulses are added and averaged. The indicator instrument

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Study of Spark Formation on Commutators

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connected to this block indicates the averaged values of the voltage impulses, i.e. they are proportional to the level of the impulses and to their number in the time unit. This wiring was recommended earlier by the authors (Ref 5) for the tuning of commutators. The great advantage of the method is that the oscillogram permits not only the observation of the spark distribution on the commutator, but also the cause of the spark formation at each segment. The article contains a series of such oscillograms. There are 8 figures and 5 references, 4 of which are Soviet. ✓

SUBMITTED: June 22, 1959

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MAGIDSON, V.V., inzh.; NAZIKYAN, A.G., kand. tekhn. nauk;
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(Electric machinery--Direct current)
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L 4221-66 ENT(1)

ACCESSION NR: AR5014257

UR/0196/65/000/005/1008/1009
621.313.2:621.3.014.2

SOURCE: Ref. zh. Elektrotekhnika i energetika, Abs. 5154

AUTHOR: Karasev, M. F.; Kozlov, V. N.

TITLE: Optimal commutation in d-c machines

CITED SOURCE: Nauchn. tr. Omskiy in-t inzh. zh.-d. transp., v. 44, 1964, 5-48

TOPIC TAGS: dc machine, commutation

TRANSLATION: The classical theory of commutation is reviewed from a modern viewpoint. These results of experimental investigations are reported: (1) The optimal commutation is somewhat accelerated and yields the least value of di/dt by the moment of its termination when $i_c \approx 0$; (2) The final stage of the optimal commutation is in good agreement with the classical theory, whereas the initial part of the commutation-current curve is determined, as a rule, by an exponential curve of the form $\Delta U_c = \text{const}$; (3) Overcommutation and undercommutation should be recognized when a deviation from the optimal commutation exists; the

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terms "overcompensation" and "undercompensation" should be deprecated because they do not denote the essence of the optimal commutation process; these terms came into being in connection with the optimal straight-line commutation, for which $e_k = e_R$. However, the optimal commutation process occurs when $e_k > e_R$; (4) The slot-current commutation transpires according to S-shape curves, with the current variation close to linear at the mid-section of the curve; (5) In the slot-current commutation curve, the optimal commutation is determined by a minimum of di/dt at the moment of its termination; (6) The "small-current step" as defined by O. Vegner does not represent the essence of a real commutation process; (7) The expediency of using brushes having G-shape current-voltage characteristics and a steep rise for small current densities is very questionable. Bibl. 13, figs. 32.

SUB CODE: EE

ENCL: 00

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Source: U-9235, 29 Nov 1956

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